

Claims

[c1] What is claimed is:

1. An optical proximity correction (OPC) method for correcting a photomask layout, the photomask layout comprising at least a first photomask pattern including a first straight line having a first line-end arranged in a first direction and a second straight line arranged in parallel with the first straight line, the second straight line having a second line-end being longer and more protrudent than the first line-end, the OPC method comprising: performing a rule-based OPC process to generate a corrected photomask layout; and adding an enhancing feature in the first line-end, a width of the enhancing feature being smaller than a width of the first straight line, and the second line-end being still more protrudent than the first line-end with the enhancing feature.

[c2] 2. The OPC method of claim 1, wherein the photomask layout further comprises a second photomask pattern, the second line-end being closer to the second photomask pattern than the first line-end.

[c3] 3. The OPC method of claim 2, wherein the second line-

end reaches to the first photomask pattern.

- [c4] 4.The OPC method of claim 2, wherein a distance is present between the first line-end and the second photomask pattern, and adding the enhancing feature is performed by shortening the distance to $1/2$ to $2/3$ times of the distance.
- [c5] 5.The OPC method of claim 2, wherein the second photomask pattern is a straight line.
- [c6] 6.The OPC method of claim 5, wherein the second photomask pattern is arranged in a second direction.
- [c7] 7.The OPC method of claim 6, wherein the first direction is perpendicular to the second direction.
- [c8] 8.The OPC method of claim 1, wherein the enhancing feature is a rectangle pattern.
- [c9] 9.The OPC method of claim 1, wherein the rule-based OPC process comprises:
collecting a width, a length, and a spacing of each of the photomask patterns of the photomask layout to obtain a group of parameters of the photomask layout;
computing a target bias of the photomask layout by using a correction rule of a database according to the group of parameters; and

adding an assist feature in the photomask layout according to the target bias.

[c10] 10.The OPC method of claim 9, wherein the assist feature is a serif or a hammerhead pattern.

[c11] 11.An OPC method for correcting a photomask layout, the photomask layout comprising:
a first photomask pattern including a first straight line, a second straight line, and a third straight line arranged in parallel with each other and in a first direction; and
a second photomask pattern;
wherein the first, the second, and the third straight lines respectively have a first line-end, a second line-end, and a third line-end closer to the second photomask pattern, wherein the second line-end is more protrudent than the first line-end and the third line-end and reaches to the second photomask pattern, a first distance is present between the first line-end and the second photomask pattern, and a second distance is present between the third line-end and the second photomask pattern, the OPC method comprising:
performing a rule-based OPC process to generate a corrected photomask layout; and
adding a first enhancing feature and a second enhancing feature in the first line-end and the third line-end of the corrected photomask layout respectively, a width of the

first enhancing feature and a width of the second enhancing feature being smaller than a width of each of the first straight line and a width the third straight line respectively, and both the first distance and the second distance being shortened.

[c12] 12.The OPC method of claim 11, wherein adding the first enhancing feature is performed by shortening the first distance to $1/2$ to $2/3$ times of the first distance.

[c13] 13.The OPC method of claim 11, wherein adding the second enhancing feature is performed by shortening the second distance to $1/2$ to $2/3$ times of the second distance.

[c14] 14.The OPC method of claim 11, wherein the first and the second enhancing feature are rectangle patterns.

[c15] 15.The OPC method of claim 11, wherein the second photomask pattern is a straight line.

[c16] 16.The OPC method of claim 15, wherein the second photomask pattern is arranged in a second direction.

[c17] 17.The OPC method of claim 16, wherein the first direction is perpendicular to the second direction.

[c18] 18.The OPC method of claim 11, wherein the rule-based OPC process comprises:

collecting a width, a length, and a spacing of each of the photomask patterns of the photomask layout to obtain a group of parameters of the photomask layout;
computing a target bias of the photomask layout by using a correction rule of a database according to the group of parameters; and
adding an assist feature in the photomask layout according to the target bias.

[c19] 19. The OPC method of claim 18, wherein the assist feature is a serif or a hammerhead pattern.